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R. A. FESSENDEN.

SIGNALING BY ELECTROMAGNETIC WAVES.

APPLICATION FILED AUG. 8, 1903.

NO MODEL.

Fig. 1.

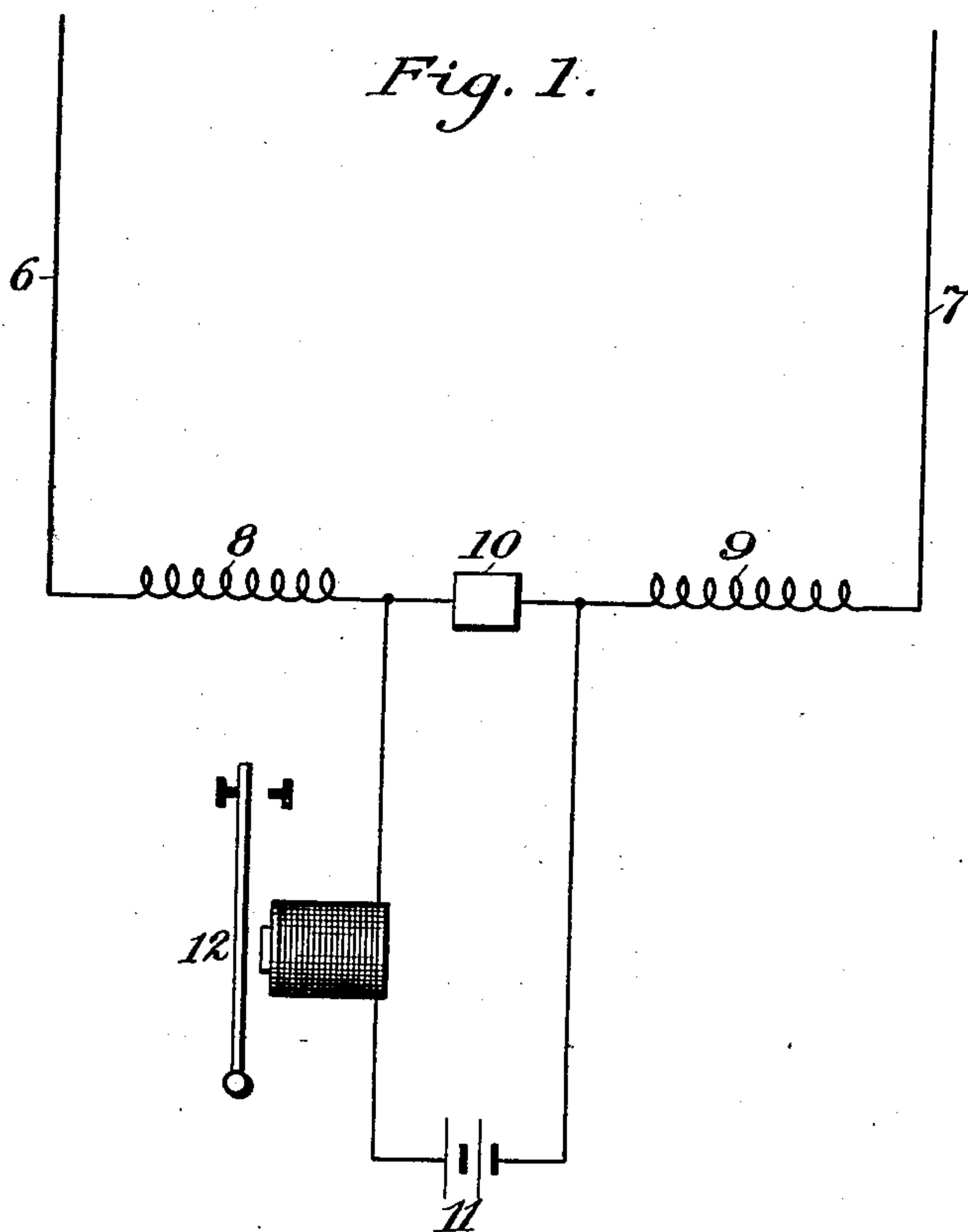
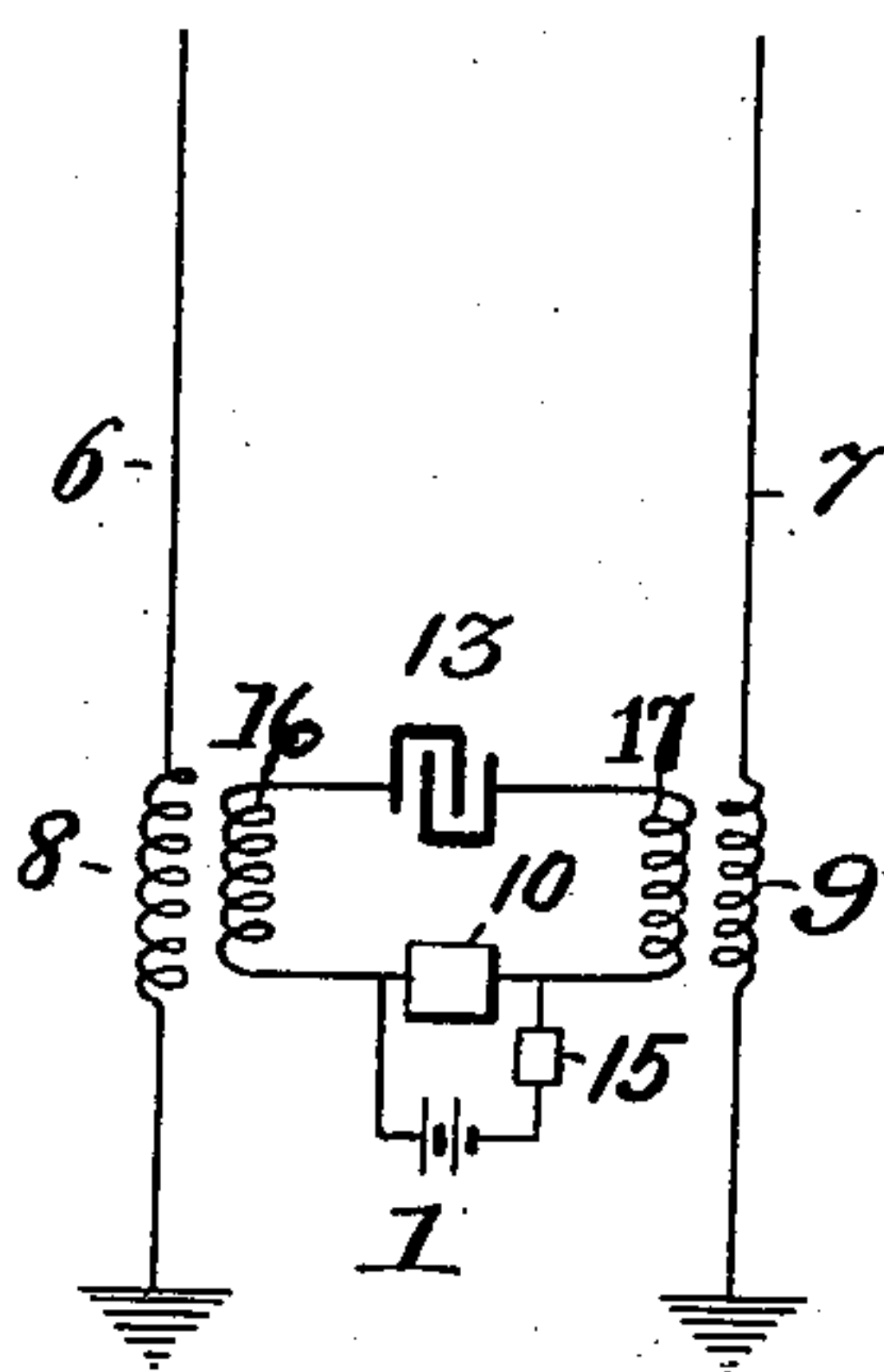


Fig. 2.



Witnesses:

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UNITED STATES PATENT OFFICE.

REGINALD A. FESSENDEN, OF FORT MONROE, VIRGINIA.

SIGNALING BY ELECTROMAGNETIC WAVES.

SPECIFICATION forming part of Letters Patent No. 742,780, dated October 27, 1903.

Application filed August 8, 1903. Serial No. 168,799. (No model.)

To all whom it may concern:

Be it known that I, REGINALD A. FESSENDEN, a citizen of the United States, residing at Fort Monroe, in the county of Elizabeth City and State of Virginia, have invented or discovered certain new and useful Improvements in Signaling by Electromagnetic Waves, of which improvements the following is a specification.

The invention described herein relates to certain improvements in selective signaling in systems where the signal is transmitted by waves, and has for its object the neutralization of disturbing impulses or waves which have not the periodicity which it is desired to receive.

Figure 1 in the accompanying drawings, forming a part of this specification, shows a diagrammatic view of a form of apparatus adapted to the practice of my invention. Fig. 2 shows a similar view where the aerials are grounded.

In the practice of my invention I employ two or more conductors 6 and 7, which are tuned to different periodicities by any suitable means, as by the wires 8 and 9, which connect the conductors to a coherer 10 or other suitable wave-responsive device. Each of the wires 8 and 9 is preferably of approximately the same length as the conductor to which it is connected.

A grounding of the receiving-conductors is not necessary, as efficient signaling can be effected without a ground. A suitable construction where a ground is used is shown in Fig. 2, where 6 and 7 are the aerials, 8 and 9 primaries of transformers, whose secondaries 16 and 17 are arranged to act upon the receiver 10. A condenser 13 may be used, as shown.

When employing a coherer, it is connected, as usual, in the circuit of a battery 11, Fig. 1, or 1, Fig. 2, and with a relay of transmitting mechanism, 12, Fig. 1, or 15, Fig. 2. In the construction here shown the wave-responsive device is affected by waves of either of the periodicities to which the receiving-conductors 6 and 7 are tuned or to both periodicities conjointly, provided that the oscillations are sufficiently prolonged. If the receiver be adjusted so as to respond only

when the effect of both the aerials is added and not to the effect produced by a single one, the receiver will only be operated by the conjoint action of the two sets of waves.

When an electric impulse is received by the conductors 6 and 7, the first few oscillations of the series of waves will generate nearly the same potential at the ends of the coherer or translating device 10, Fig. 1, or 10, Fig. 2; but if the oscillations persist and their periodicity agrees with that to which either of the receiving-conductors is tuned the potential at one end of the coherer will rise higher than that of the other and the receiver will be actuated. If, however, the periodicity of the impulse does not agree with that to which either receiving-conductor is tuned, there will be no cumulative rise in the potential at one end of the receiving device, and if the periodicity of the impulse be sufficiently different from the periodicities to which the receiving-conductors are tuned there will be no appreciable rise at one end above that of the opposite end.

As the coherer or other translating device is so constructed as to be unresponsive to approximately equal potentials or the potentials so nearly neutralize each other as to produce no operative effect on the coherer or wave-responsive device, it follows that the apparatus at any receiving-station will not respond to any wave or series of waves or impulses which will not produce or generate at the coherer or other wave-responsive device potential differing to a predetermined degree. Thus disturbing impulses produced by other stations or by atmospheric disturbances will be unable to affect the receiver.

It is preferred that the aerials 6 and 7 should be of approximately the same height—i. e., should not differ more than a few per cent.

Where this invention is used for wire lines, as telegraph lines or cables, the conductors 6 and 7 in Fig. 2 are preferably connected to each other above the coils 8 9 and the junction connected to the line-wire. In this case condensers are preferably placed in series with each of the conductors 6 and 7. Also instead of grounding the conductors 6 and 7 they may be connected to a return-conduc-

tor. Instead of a coherer a cumulatively-acting receiver of the current-operated type, as a barretter, is preferably used.

What I claim as my invention is—

- 5 1. As an improvement in the art of signaling by periodic impulses the method herein described which consists in causing a disturbing influence to produce equal effects, and neutralizing these effects on the receiver.
- 10 2. As an improvement in the art of signaling by periodic impulses the method herein

described which consists in causing a disturbing influence to produce a plurality of equal effects, and neutralizing these effects on the receiver.

In testimony whereof I have hereunto set my hand.

REGINALD A. FESSENDEN.

Witnesses:

DARWIN S. WOLCOTT,
WM. H. DE LACY.